What is claimed is:

1. A method executed in an apparatus for generating graphics data indicating shape features of three-dimensional graphics based on X, Y and Z coordinate values, comprising the steps of:

5   determining X and Y coordinate values of a shape specific point for specifying the shape of said three-dimensional graphics;

generating a random number using the X and Y coordinate values as seeds;

calculating a Z coordinate value of said shape specific point based on

10 the generated random number; and

generating said graphics data based on the Z coordinate value and the X and Y coordinate values of said shape specific point.

2. The graphics data generating method according to claim 1, wherein said number is generated using two types of mutually different

15 random number generating functions using the X and Y coordinate values as seeds.

3. A method executed in an apparatus for generating graphics data indicating shape features of three-dimensional graphics based on X, Y and Z coordinate values, comprising the steps of:

20 setting a shape specific point provisionally among a plurality of shape specific points for specifying the shape of said three-dimensional graphics;

calculating X and Y coordinate values of said provisional shape specific point and generating a random number using the X and Y

25 coordinate values as seeds;

calculating a Z coordinate value based on the generated random

number; and

using the point including the calculated X, Y and Z coordinate values as a new shape specific point and generating said graphics data based on the new shape specific point.

5   4. The graphics data generating method according to claim 3, wherein the X and Y coordinate values of said new shape specific point are the X and Y coordinate values of a midpoint between a pair of shape specific points which is the basis thereof.

5. The graphics data generating method according to claim 3,

10   wherein the X and Y coordinate values of said new shape specific point are the X and Y coordinate values of a midpoint of a virtual line connecting a midpoint of a first side of a quadrangle formed on a projecting plane when each of two pairs of shape specific points which are the basis thereof is projected onto the XY plane, and a midpoint of a

15   second side facing said first side.

6. The graphics data generating method according to claim 3, wherein said number is generated using two types of mutually different random number generating functions using the X and Y coordinate values as seeds.

20   7. A method executed in an apparatus for generating graphics data indicating shape features of two-dimensional graphics based on X and Y coordinate values, comprising the steps of:

provisionally setting a shape specific point between a pair of neighboring shape specific points when a plurality of shape specific

25   points for specifying the shape of said two-dimensional graphics is projected on the X-axis;

generating a random number using the X coordinate value of the provisional shape specific point as a seed of random numbers;

calculating the Y coordinate value based on the generated random number; and

5   using the point including the calculated X and Y coordinate values as a new shape specific point and generating said graphics data based on the new shape specific point.

8. A graphics generating apparatus for generating two-dimensional or three-dimensional graphics whose shape features are specified by

10   positions of a plurality of shape specific points, comprising:

a random number generator for generating a random number whose value is determined according to a seed entered; and

a determinator for determining positions of said plurality of shape specific points, wherein

15   the position of at least one of said plurality of shape specific points is expressed by default coordinate values and variable coordinate values,

said determinator instructs said random number generator to generate a random number using said default coordinate values at one of said shape specific points as said seed and determines the position of

20   said at least one shape specific point by calculating said variable coordinate values based on the random number.

9. The graphics generating apparatus according to claim 8, wherein when there is a plurality of said default coordinate values, said determinator generates said random number using random number

25   generating functions differing from one coordinate value to another.

10. The graphics generating apparatus according to claim 8,

wherein said graphics is a three-dimensional graphics based on the X, Y and Z coordinate values,

said default coordinate values are the X and Y coordinate values of any one of said plurality of shape specific points, and

5   said variable coordinate value is the Z coordinate value of any one of said shape specific points.

11.   The graphics generating apparatus according to claim 8, wherein said graphics is a two-dimensional graphics based on the X and Y coordinate values,

10   said default coordinate value is the X coordinate value of any one of said plurality of shape specific points, and

said variable coordinate value is the Y coordinate value of any one of said shape specific points.

12.   The graphics generating apparatus according to claim 8,

15   wherein said graphics is a three-dimensional fractal graphics, which will probably reach the same point through a plurality of paths.

13.   The graphics generating apparatus according to claim 10, wherein said graphic generation apparatus further comprising:

a storage unit for storing X, Y and Z coordinate values of at least two

20   of said plurality of shape specific points; and

a shape specific point generator for specifying the positions of shape specific points based on the X, Y and Z coordinate values of a pair of shape specific points read from the storage unit and generating a midpoint of a virtual line connecting between the specified shape specific

25   points as a new shape specific point, wherein

said determinator instructs said random number generator to

generate a random number using the X and Y coordinate values of said new shape specific point as said seed and determines the position of said new shape specific point by calculating the Z coordinate value of said new shape specific point based on the random number.

5   14. The graphics generating apparatus according to claim 10, wherein said graphic generation apparatus further comprising:

a storage unit for storing X, Y and Z coordinate values of at least some of said plurality of shape specific points; and

a shape specific point generator for generating a midpoint of a virtual
10 line connecting between a midpoint of a first side of a quadrangle formed on a projecting plane when each of two pairs of shape specific points read from the storage unit is projected onto the XY plane, and a midpoint of a second side facing said first side as a new shape specific point, wherein

said determinator instructs said random number generator to
15 generate a random number using the X and Y coordinate values of said new shape specific point as said seed and determines the position of said new shape specific point by calculating the Z coordinate value of said new shape specific point based on the random numbers.

15. The graphics generating apparatus according to claim 14,
20 wherein said shape specific point generator generates repeatedly said new shape specific points according to external instructions, and

said determinator changes the range of generating said random numbers every time a new shape specific point is generated.

16. The graphics generating apparatus according to claim 14,
25 wherein said storage unit additionally stores the X, Y and Z coordinate values of said new shape specific points generated as the shape specific

points to be read.

17. A semiconductor device incorporated in an apparatus provided with a random number generator for generating a random number whose value is determined according to a seed entered, for generating

5 two-dimensional or three-dimensional graphics whose shape features are specified according to the positions of a plurality of shape specific points in coordination with the apparatus, wherein

the position of at least one of said plurality of shape specific points is expressed by default coordinate values and variable coordinate values,

10 comprising means for instructing said random number generator to generate a random number using said default coordinate values at any one of said shape specific points as said seed and determining the position of said one shape specific point by calculating said variable coordinate values based on the random numbers.

15 18. The semiconductor device according to claim 17, wherein there is a plurality of said existing coordinate values, said random number generator generates said random number using a plurality of random number generating functions differing from one coordinate value to another.

20 19. A computer program for rendering a computer to serve as a graphics generating apparatus for generating two-dimensional or three-dimensional graphics whose shape features are specified according to the positions of a plurality of shape specific points, said graphics generating apparatus comprises:

25 a random number generator for generating a random number whose value is determined according to a seed entered; and

a determinator for determining positions of said plurality of shape specific points, wherein

the position of at least one of said plurality of shape specific points is expressed by default coordinate values and variable coordinate values,

5   said determinator instructs said random number generator to generate a random number using said default coordinate values at any one of said shape specific points as said seed and determines the position of said shape specific point by calculating said variable coordinate values based on the random numbers.

10   20.   A computer program according to claim 19, wherein the computer program is stored in a computer readable storage medium.